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OYSTER FARMING IN PRINCE EDWARD ISLAND

BY

M. J. PATTON

ASSISTANT SECRETARY,
COMMISSION OF CONSERVATION



Reprinted from the Fourth Annual Report
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DURING the past year the Dominion Parliament waived its claim to granting leases to the oyster areas of Canada, and, consequently, the disposal of these areas now rests entirely with the provinces. The act granting these concessions was passed at the last session of the Dominion Parliament. It empowers the governor in council to "authorize the government of any province to grant leases of such areas of the sea coast, bays, inlets, harbours, creeks, rivers and estuaries of such provinces as the government of such province considers suitable for the cultivation and production of oysters." Thus a way was opened up whereby the disposition of both the barren and the producing oyster areas could be placed under provincial jurisdiction. The provinces were not slow to take advantage of this and Nova Scotia, Prince Edward Island, New Brunswick and British Columbia—all the oyster-producing provinces—have entered into agreements with the Dominion government, giving them the undisputed right to lease the oyster areas within their boundaries. While the Dominion thus relinquished its claim to the disposal of these bottoms, it still possesses the full legislative jurisdiction, as confirmed by the decision of the Judicial Committee of the Imperial Privy Council in 1898, and makes and enforces all laws and regulations under which the oyster fishery is carried on.

Survey of
Richmond
Bay

As soon as the agreement with the Dominion was executed, the government of Prince Edward Island took steps to make available to its inhabitants the large areas of potential oyster areas that it possessed. Preparatory to granting leases, Mr. H. H. Shaw, Provincial Engineer, was detailed to make a survey of all the tidal rivers and coastal waters. During 1912 he completed a survey of Richmond bay, which, before its depletion, produced large quantities of the famous Malpeque oysters. It was found to contain approximately 14,700 acres, most of which is available for oyster culture. The plan of survey shows the bay divided into 20-acre plots, each of which is divided into four plots of 5 acres each. The depth of the water at low tide and the character of the bottom are also indicated.

In 1913, additional parties will be detailed to the work, and the survey of the remaining areas completed as rapidly as possible. As Prince Edward Island has a coast line some 800 miles in length, this is a work of no small magnitude.

Leasing Regulations When the survey was nearing completion, the Provincial government formulated regulations for the issuing of leases and in the autumn of 1912 applications for leases of areas in Richmond bay were received. On October 17th, applications were called for from adult persons who had been residents of the Island for at least one year. Riparian owners were given the first opportunity to secure leases of 5-acre plots contiguous to their property, and, after these applications had been filled, the applications of other residents were considered. In the case of two persons, not riparian owners, applying for the same plot and failing to arrive at a satisfactory settlement, the lease to the disputed area was put up at auction and sold to the highest bidder. The time for receiving applications expired on November 20th, but a second opportunity to obtain areas, extending from November 30th to December 16th, was given to residents. This time they were not restricted to 5-acre plots and those who had already been granted leases were allowed to obtain additional areas. After December 16th, applications for leases from non-residents of the Island were considered.

The lease extends over a term of twenty years and, at its expiration, is renewable at the option of the lessee for a further period of twenty years. The rent charged is \$1 an acre for each of the first five years, \$3 an acre for each of the second five years and \$5 an acre for each of the remaining ten years. If the lease is renewed, the rent for each of the second twenty years is at the rate of \$5 per acre per year, and, in addition, the lessee must agree to pay any royalty on the oysters produced, which the Province may levy. Areas leased cannot be sub-let or otherwise disposed of except on the written consent of the Attorney General of the Province, and the lease is subject to cancellation unless the beds are properly cultivated and maintained.

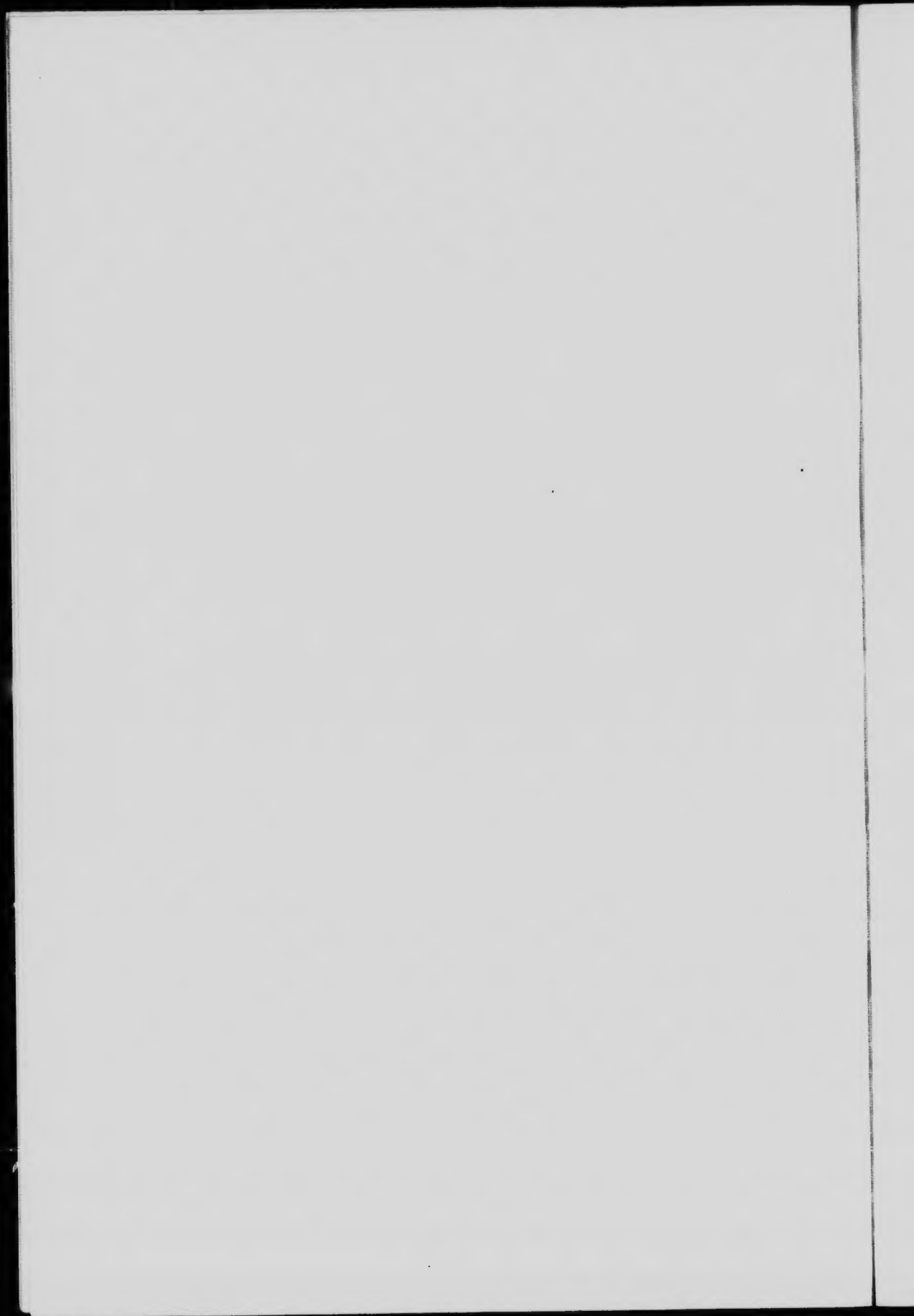
Available Oyster Area Until the survey is finished the area available for oyster farming will not be definitely known. There are, however, certain portions of the foreshore of the Province that have produced oysters in varying quantities ever since the Island was settled, and it is a fair assumption that barren areas in these districts can be cultivated successfully. The greater portion of the oysters



GUARD BOAT ON SHARP BROS.' OYSTER BEDS AT SQUIRREL CREEK, P.E.I.
 An armed man is stationed on this boat, day and night, to keep poachers from stealing oysters from the beds.



GUARDING THE INMAN OYSTER BEDS AT SHEPODY CREEK, P.E.I.
 Owners have to protect their own beds from poachers. A guard armed with an Enfield rifle occupies this house at night.



produced now come from the north, or Gulf shore of the Island, the principal indentation of which is Richmond bay. Other than this last-named bay, the chief oyster-producing areas are found at East river, East Bideford, Mill river and Hill river. At East Bideford good quality cup oysters are produced. A superior grade of oyster is grown here on the private areas of Sharp Bros., the oldest cultivated beds in the Province. The natural beds produce considerable quantities but the uncultivated oyster is always smaller and of poorer shape than that grown on cultivated bottoms. At Hill river and Mill river a long thin oyster is found, much inferior as regards both size and flavour to those of East Bideford and Richmond bay. To the east of Richmond bay, in East river, large quantities of oysters are fished from the natural beds. The East River oyster is well shaped but the fishermen say it is saturated with salt water when caught and does not taste as well as the Curtain Island oyster. It is said to keep better than the Curtain Island variety, however, and improves in flavour as it remains longer out of the water. At Enmore river, on Northumberland strait, a small round oyster of good quality is found, though in very small quantities. The bottoms here and in Percival bay are conceded locally to be good prospective oyster-farming areas. Limited quantities of oysters of very fair quality are also taken from Percival bay, Orwell bay, Vernon river, and other portions of Hillsborough bay. No oysters are taken from the waters of Kings county, although the existence of deep beds of old oyster shells shows how plentiful they once were there, and suggests the possibility of successful cultural operations.

PRESENT OYSTER-CULTURE OPERATIONS IN PRINCE EDWARD ISLAND

Despite the unsatisfactory titles obtainable for oyster areas prior to 1912, there are a few oyster farmers who have managed to cultivate beds. The oldest and largest private beds on the Island are those in the Narrows at East Bideford belonging to Sharp Bros. The title to these can not be disputed because the grant was made prior to Confederation and the British North America Act provides that proprietary rights vested in individuals prior to the passing of that act are not affected by its terms.

The area now held by Sharp Bros. was formerly the property of the Pope family and passed eventually into the hands of John Richards, from whom Sharp Bros. purchased it. It is situated at Squirrel creek and comprises an area of from 40 to 50 acres, the exact extent not being easily arrived at on

Sharp Bros.
Beds

account of the indefiniteness of the boundary descriptions. The area comprises about 5 acres of an old natural bed and, including this, there is now about 8 acres under cultivation. With the exception of the 5 acres of old natural bed, the area has a soft blue mud bottom, thickly overgrown with eel grass. On 3 acres of this mud bottom a solid bottom has been made by sinking rafts made of $\frac{5}{8}$ -in. lumber covered with gravel and old shells. Inferior oysters picked from the public beds are planted on these artificial bottoms. The area of the producing bottoms is being extended in this way at the rate of an acre a year. It has been found that the lumber, when sunk in this blue mud, is protected from the attacks of marine borers and will last indefinitely. The cost of making bottoms of this description and stocking them with seed oysters is about \$1,000 an acre.

Sharp Bros. consider 500 to 700 bushels of seed oysters of such a size as to be ready for market in a year, sufficient to stock an acre. In eighteen months the oyster increases from one-third to one-half in size. They depend mainly, however, on the set of spat to re-stock the beds. This has proved remarkably abundant and the whole area held is covered with a multitude of small oysters that attached themselves to the shells and old oysters this year. Not only this, but the public beds in the vicinity are heavily stocked with spat from these private beds. The fishermen say that they have never seen such a heavy catch before. At one lift of the tongs covering an area of 9 sq. ft. of bottom we lifted 75 oysters of all sizes—that is over 8 to the square foot. This lift was taken from the old bed, not from ones recently planted on the board bottoms. As an instance of the efficacy of the set of spat to stock the areas, Sharp Bros. informed me that it was a very common occurrence to get 100 oysters at a tongful from bottoms where no seed oysters had been planted.

Last year, 100 barrels of American seed oysters were imported. These came from Long island and Oyster bay, but were purchased through New York commission men. The cost was \$5.35 a barrel, delivered.

The harvest from the Sharp beds during the past three years has been as follows:

1909—259	barrels	which	brought	in	\$2,468.25
1910—284	“	“	“	“	2,560.25
1911—336	“	“	“	“	2,933.75
1912—410	“	“	“	“	3,406.50

The number of barrels in each of the years above alluded to from 1909 to 1911 includes about 80 barrels taken from the public beds. In 1912, about 150 barrels were taken from the public beds.

Inman Beds The Inman beds, situated on Shemody creek on Richmond bay, differ from the Sharp beds in having quite shallow water over them, the depth in some places at low water being little more than a foot. They cover an area of approximately $5\frac{1}{2}$ acres and are held under lease from the Dominion Government by T. H. E. Inman and James Morrison of Summerside. The authority of the Dominion Government to grant such leases being questioned, the lessees naturally have been troubled a good deal by poachers. Indeed, they had \$80 worth of oysters stolen in a single night a year ago last autumn. Since then a man armed with an Enfield rifle has been stationed in a little house on the shore to guard the property. (See illustration facing page 78.)

The nucleus of the bed is an old natural bed, but planting is being done on contiguous barren bottoms as well as on this natural bed. Small and medium sized oysters, imported from the United States at a cost of about \$4.50 a barrel, delivered, are used for planting purposes. These thrive remarkably well and Mr. Inman is of the opinion that they reproduce here. It must be remembered, however, that the shallow water on these beds is of a much higher temperature than deeper water would be. The shallowness of the water also makes it necessary to harvest in the autumn oysters planted in the spring, in order to avoid the destructive action of the ice. The seed oysters grow fast, however, (increasing about one-third in bulk in six months) and a handsome profit is made by buying in the spring at \$4.50 a barrel and selling the increased yield in the fall at around \$8 a barrel.

Tracadie Bay Mr. Major McKinnon has the remnant of a planted oyster bed on Tracadie bay, which has a soft mud bottom. Mr. McKinnon stated that four years ago he had prepared a bed here and planted 140 barrels of oysters on it. During the winter he was absent from home and, on his return, found two mud-digging machines busily engaged in digging out his oyster bed. They destroyed it all except a fringe around the outside, and even this was badly silted up. Under the law existing then, he could secure no redress. The few remaining oysters, in spite of the difficulties to be overcome, had propagated and developed rapidly.

The method adopted by Mr. McKinnon in preparing a bed on a mud bottom differs considerably from that of Sharp Bros. First, he sinks a raft of poles on which brush to a depth of about 10 inches is

laid. Over this he places about 5 inches of broken stone upon which cultch to a depth of 3 inches is spread. Such a bed is placed considerably above the level of the surrounding bottom and he claims the rise and fall of the tide causes a greater current of water to flow over it, thus affording the oysters additional food. He estimated that 200 barrels of seed oysters planted in the spring in Tracadie bay would grow to 300 barrels by fall. In his opinion a first-class producing oyster bed one acre in area was worth \$5,000.

Mr. H. C. Mills, an oyster dealer in Summerside, said **Locke Shore** that he had imported nearly 100 barrels of American oysters last fall and planted them in Malpeque bay off Locke shore. They had done well in their new environment and the experiment was encouraging in every sense. Outside of these few instances practically no oyster farming has been done in Prince Edward Island. The success that these men have had, however, together with the new conditions whereby a valid lease can be granted, makes it very probable that a flourishing industry will be built up in the course of a few years.

IMPORTANT CONSIDERATIONS IN OYSTER CULTURE

Choice of Location While the area of barren bottoms capable of producing oysters is very large, the fact must not be lost sight of that locations vary widely in their suitability for oyster-culture work. One of the first requisites of a successful oyster bed is a firm, hard bottom. There is a great deal of soft mud bottom around the shores of Prince Edward Island and if oyster planting is to be done on these, the first thing to be done is to construct over the mud a firm hard bottom on which the cultch and the spawners may be laid. Sometimes this artificial bottom is made of board rafts covered with gravel and shells, sometimes of poles, brushwood and rock, the material used depending on its availability and cheapness in the particular locality.

Murray Harbour Bed The importance of selecting a suitable bottom for planting cannot be over-estimated. In many places around Prince Edward Island, especially on muddy bottoms, there is a heavy growth of eel grass which is inimical to the development of oysters. The history of the bed planted at Murray harbour by Captain Kemp brings out this difficulty well. The bed was prepared in 1899 and planted with 84 barrels of small oysters. I inspected the bed from a launch and found that it had been planted on a mud bottom and that

there was an exceedingly heavy growth of eel grass over it. It had been given no attention since 1907 and I was told that many of the oysters had been stolen from it. We made about twenty-five lifts with the tongs and took only one oyster. This was a cup oyster of good quality, about $4\frac{1}{2}$ inches long, which had been partially buried in the mud. Several other specimens were brought up, which at first were thought to be alive, but on closer examination, it was found that there were no oysters between the shells. As the hinges were intact, it is likely that the oysters had grown to this size before being eventually smothered by the mud and eel grass. The character of the bottom in Murray harbour was examined in several places and, in every case, it was found to be black mud covered with eel grass. The condition of this bed illustrates the difficulty that the oyster farmer will have to meet if he plants on a mud bottom that has not been properly prepared and is not carefully looked after.

Salinity and Temperature In determining the location of a bed, care should also be taken to see that the water at low tide is sufficiently deep to prevent the ice damaging the oysters in the winter and in the spring. Then, again, the salinity of the water covering the beds is a matter of no small importance. If too much fresh water mingles with the salt at that point the oysters will not do so well and their texture will be flabby. If the temperature of the water is low, growth will be slower than in warmer water, although the quality of the meat will be better. The depth of water over the bed largely determines its temperature, the shallower water being warmer than the deeper. Where the water is cold the spatting occurs later in the season, and when oysters from the warmer waters of the United States are planted in our cold waters, they are not likely to spawn until they become acclimatized. The waters of various places also vary widely in their nutritive value. One of the greatest needs of the oyster farming industry in Canada to-day is scientific analysis of the water over prospective oyster areas to determine whether it is sufficiently nutritive to justify the expense of planting operations.

Mud Digging and Oyster Farming The digging of oyster mud in the winter by the farmers bears an important relation to the work of oyster culture in several ways. In the first place, mud-digging operations carried on too close to an oyster bed are liable to smother the oysters with silt. The Dominion Government, which, as before stated, has legislative jurisdiction over the fishery, has ruled that mud digging must not be carried on nearer than 200 yards to a live oyster bed, and

then, only on the written permit of a fishery inspector. Now that oyster farming is being engaged in, it is imperative that the fisheries officials exercise great care in granting permits for digging mud near cultivated oyster areas.

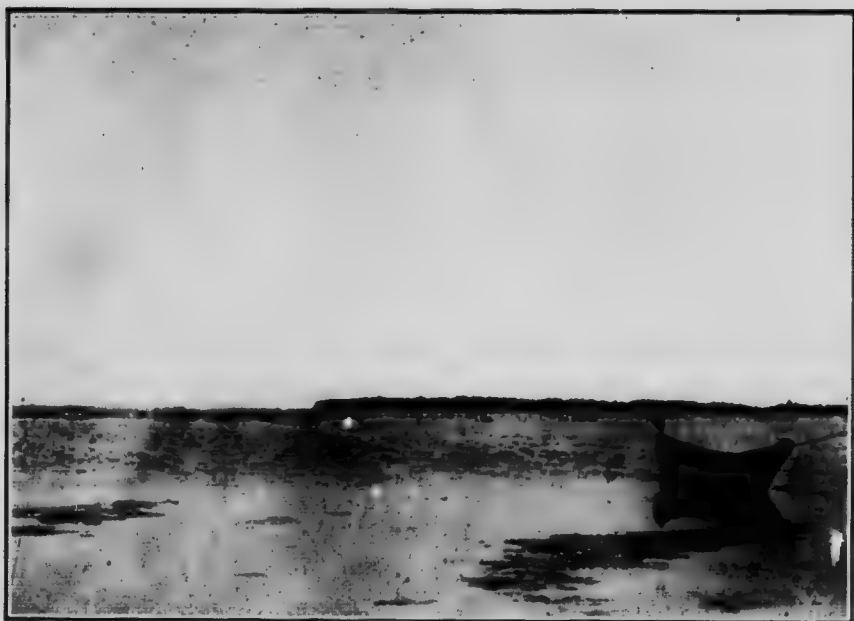
An additional use will be found for the dead oyster beds when a large area of bottoms comes under cultivation. The oyster farmer must have cultch to which the oyster larvæ may attach themselves in the spawning season and, in many localities, clean, large shells suitable for this purpose, may be obtained from old oyster beds. Sharp Bros., at East Bideford, now secure from these dead beds, a large proportion of the cultch used on their oyster bottoms. As the oyster trade of the Island is entirely a half-shell one, there is no possibility of procuring any of the shells of the oysters now being fished.

Lastly, the mud digger comes into touch with the oyster farmer in that the areas from which he has dug out the oyster mud may possibly be again made to produce oysters. Mud digging is carried on everywhere along the coast, but the two bodies of water where it is most extensively pursued are Bedeque bay and St. Peter bay. From 500 to 600 cars of oyster mud are shipped from Bedeque bay each winter, while the mud-digging operations in St. Peter bay, where a depth of 39 feet in solid oyster beds has been reached, are on an even more extensive scale. The mud-digging machines have dredged out great furrows in the bottom of these bays and the surface left is so uneven that it could not possibly be utilized for planting oysters. Any young oyster placed in the furrows would soon be smothered by the silt drifting down from the higher portions of the bottom.

**Extending
the Oyster
Area**

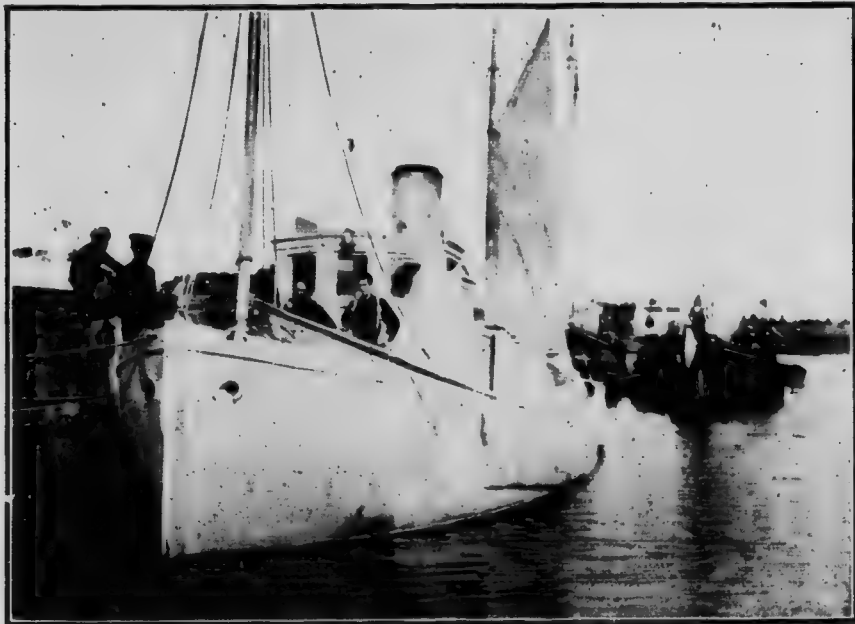
The Provincial Government, however, is considering a plan to obviate this difficulty. The proposal is to prohibit the public from digging mud on these bays and to install large steam dredges to dredge out the old shells, leaving a level bottom on which oysters may be planted. The farmers would be appeased by being allowed to purchase at cost the shells thus lifted. This plan appears to be quite feasible, although only an actual test could definitely determine its success.

One thing at least is certain, and that is: The immense deposits of oyster shells show that the waters of these bays in years gone by were eminently suitable for the production of oysters. As a matter of fact, the flavour of the Bedeque oysters still lingers in the memories of the older fishermen as being equalled only by those from Richmond bay.



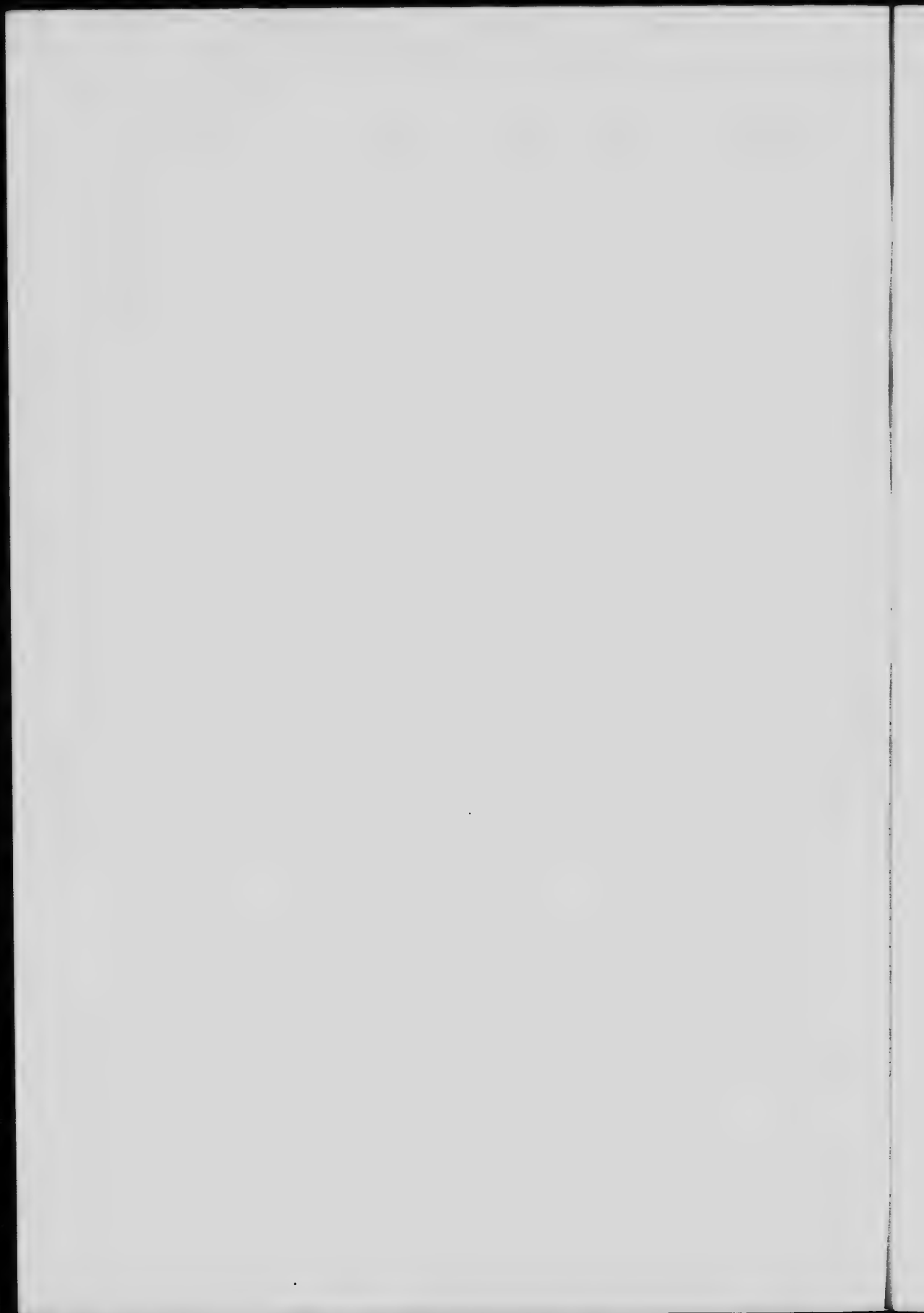
OYSTER COVE, INDIAN RIVER, P.E.I.

This inlet is an arm of Richmond bay and is good potential oyster ground. A small natural oyster bed exists off this shore.



THE *Ostrea* AT MALPEQUE, P.E.I.

This little boat is overworked. She has to keep the public oyster beds in condition, look after the Dominion Government's experimental oyster culture work and keep poachers off the oyster beds of Canada's whole Atlantic seaboard.



**Determining
When the
Spat Settle**

Another vital feature in oyster culture is judging correctly when the settling of the oyster spat takes place. The spawning season occurs during the latter part of July and the larvae settle as spat about the middle of August. If the cultch, to which it is intended these larvae will attach themselves, is put down too long before the fixation of the larvae occurs, it becomes alimy and the larvae cannot attach themselves to it. The aim of the oyster farmer is, therefore, to put down his cultch just before the fixation of the larvae takes place. Professor Stafford of McGill University, in his study of the development of the oyster has perfected a method, by means of microscopic examination, whereby the time of fixation may be definitely determined.* This, however, cannot be applied by the ordinary oyster farmer unless he has received some instruction in it. Until the application of this method can be made general, the time of putting out the cultch must be decided, as heretofore, by rule of thumb. As soon as there are a considerable number of areas under cultivation in Prince Edward Island, it is very desirable that either the Dominion or the Provincial Government should instruct the oyster farmers how to apply Professor Stafford's method.

FISHERIES PROTECTIVE SERVICE

It is imperative that the Dominion fisheries protective service be improved so as to afford adequate protection to cultivated oyster beds. In its present condition it is almost worthless. Sharp Bros. are compelled to keep a patrol boat on their oyster beds to ward off poachers† and the Inman beds at Shemody creek are protected by an armed sentinel on the shore. Now that the people of the Island are entering upon oyster farming on an extensive scale, it is absolutely necessary that the Dominion Government enforce the law.

**System
Defective**

The fisheries protective service, as at present organized, is inefficient and must remain so as long as the present method of appointment prevails. Under the present system, the fishery guardians are local men—farmers or fishermen—who receive their appointment because of their political affiliations and are paid a small sum yearly for seeing that the fisheries regulations are enforced in their districts. The appointee knows he was not appointed because of his peculiar fitness for discharging the duties of his position,

* Prof. Stafford gives a popular exposition of this method in his article on "The Conservation of the Oyster," in *Sea-Fisheries of Eastern Canada*, published by the Commission of Conservation in 1912.

† See illustration facing page 78.

but because he belongs to a particular political party. The inevitable result of this system is to cause him to regard his position as a sinecure and to make his attention to duty a most perfunctory one at best. Moreover, the salary given him tends to strengthen this impression; it is so small that he could by no means devote much attention to his work. Besides, being a local man, he must not be too hard on his neighbours who break the laws now and again. If he were too strict, he and his family would be socially ostracized. The result is a protective service that is looked upon as a joke by the whole community. In every little fishing hamlet there are stories of how the laws are broken and of how the guardians wink at law-breaking, keeping studiously out of the way when they know it is going on. Not only can such an inefficient organization do but little to protect the fisheries, but it tends to debauch the morals of the whole country where it exists. No one who has not mingled among these people can imagine how it demoralizes the finer sensibilities of a law-abiding citizenship and engenders a disrespect for all law.

**Suggestions
for Improve-
ment**

It is not so much the officials as the system that is at fault. I am of the opinion that the best results would be achieved by appointing officials at salaries which would permit them to give their whole time to their duties. If the guardians were paid adequate salaries and compelled to give their whole attention to the work, fewer officials would be required to do the same amount of work. All the appointments should be made on the ground of capability, not politics. Under no consideration should guardians for a district be appointed who are residents of that district. If an official is to discharge his duties properly in any district, he must come to it as a stranger. Furthermore, the officials should be moved to new districts every three or four years, and the inspectors placed over them should have absolute power to suspend and to dismiss them for inefficiency or neglect of duty. In no other way can discipline be built up. It must be remembered that the people in these fishing districts have been used to seeing the law scoffed at and trodden under foot for years and that the new organization will have to work against a strong public feeling of suspicion. Talk about reorganization of the fisheries protective service to these people and they will shake their heads in a knowing way and say, "Yes we have seen reorganizations before and they all amounted to the same thing." To overcome this feeling on the part of the people the service must be placed under a rigid system of inspection and strong-handed discipline.

REVISION OF PRESENT REGULATIONS

Close Season and Marketing

Once the protective service has been reorganized the next essential is a thorough revision of the existing regulations respecting oyster fishing. The present regulations were intended to apply to free-fishing conditions and not to conditions where oyster culture prevails. The regulation fixing a close season, although quite proper when it was formulated, has, with the advent of oyster farming, become most unjust and unfair. The effect of it is to prevent the oyster farmer from marketing his crop except in the open oyster-fishing season which extends from October 1 to March 31. The result is that, on account of winter conditions, oysters can be fished and marketed practically only during two months of the year. As a consequence, large quantities are thrown on the market during these two months and prices are demoralized. When a man plants and cares for an oyster bed there is no good reason why he should not be allowed to sell his oysters at any time they can be profitably marketed. Self-interest will force him to see that he does not work injury to his bed. It can readily be seen how the progress of oyster farming will be retarded unless provision is made whereby oyster culturists may market their products at any time they choose to do so.

Packing and Grading

The fixing of a standard-sized oyster barrel and the establishment of a system of government inspection and branding of the packages are two other matters which require the immediate attention of the Department. I have interviewed the largest oyster dealers in Montreal on this subject and they are unanimous in their opinion that the Prince Edward Island oysters, although naturally superior in quality, cannot hold their own against the United States oyster unless they are properly graded and put up in packages of fixed size. Oyster consumers, they declare, demand the highest class article they can procure, regardless of cost. This, however, is a fact that the oyster fisherman cannot fully appreciate, and consequently, he is ruining his own prospects by shipping small and inferior oysters in packages of all sizes. When a retailer buys a barrel of oysters he must know approximately how many oysters there are in it, else he cannot determine the proper price at which to sell them. If the barrel is not of standard size and the oysters are not graded, he sells them at either too high or too low a price. Thus, either the customer or the dealer is cheated, and either contingency is disastrous to the Prince Edward Island oyster.

**Inspection
and
Branding**

It is to be expected that, with the inauguration of oyster culture, an attempt will be made to market large quantities of transplanted United States oysters as genuine Malpeques. Although such oysters, after being in Prince Edward Island waters a certain length of time, do absorb the flavour of the native product, yet the knowledge that they are being sold cannot help but interfere with the market for the well-known Malpeques. It is necessary that these United States seed oysters be imported for a few years till the beds can be adequately stocked, but, when being marketed, they should be carefully distinguished from the Prince Edward Island oyster. This distinction cannot be made unless a Government system of inspection and branding is established.

Summary

In summarizing, it may be said that the prospects for the establishment of a profitable oyster-farming industry in Prince Edward Island are encouraging. Now that the oyster farmer can procure good titles to bottoms, the responsibility rests on the Dominion Government and the Provincial governments to see that the conditions under which he works be made as favourable as possible. What is most urgently needed is a change in the present oyster-fishing regulations which were not intended to apply to oyster-culture conditions. This will, no doubt, be speedily effected; no good reason can be advanced why it should not be. The need for the reform of the fisheries protective service is particularly urgent. As constituted at present, it is ineffective in protecting the fishery and is debasing the moral tone of the fishing communities as well. That a reorganization is urgently required is admitted by all; the danger lies in continued delay. As little is known scientifically about the propagation of oysters in Canadian waters, it would be a great boon to the oyster farmers if the governments concerned would have scientific researches made by a man of scientific attainments, who could also appreciate the practical and economic aspects of the industry. No argument can be advanced why a standard-sized barrel should not be adopted by law and a system of government branding established. The markets require it and an extended investigation is not necessary to determine the details. Just at present people in Prince Edward Island are very enthusiastic over the business of oyster farming. It is, however, an industry in which success can not be won without the possession of accurate knowledge and the adoption of sound business principles, and it therefore behooves the government authorities to do all in their power to prevent this initial enthusiasm of the oyster farmer from being dulled.

